

**What is claimed is:**

1           1. A method for forming a double density wordline,  
2 comprising:

3           providing a semiconductor substrate;

4           sequentially forming a poly layer, a first insulating  
5           layer, a first sacrificial layer, a second  
6           insulating layer, and a photoresist layer with a  
7           wordline pattern on the semiconductor substrate;  
8           sequentially etching the second insulating layer and the

9           first sacrificial layer using the photoresist layer  
10          as an etching mask until the first insulating layer  
11          is exposed to form a first wordline mask, a second  
12          wordline mask, and an opening therebetween;

13          removing the photoresist layer;

14          forming a spacer on a sidewall of the opening;

15          forming a second sacrificial layer in the opening;

16          removing the spacer, the second insulating layer, and  
17          the first insulating layer under the spacer to form  
18          a third wordline mask composed of the second  
19          sacrificial layer and the first insulating layer  
20          thereunder; and

21          etching the poly layer to form a first wordline, a second  
22          wordline, and a third wordline using the first  
23          wordline mask, the second wordline mask, and the  
24          third wordline mask as etching masks.

1           2. The method for forming a double density wordline  
2 of claim 1, further comprising a silicide layer over the surface  
3 of the poly layer.

1           3.    The method for forming a double density wordline  
2    of claim 2, wherein the silicide layer is a tungsten silicide  
3    layer.

1           4.    The method for forming a double density wordline  
2    of claim 3, wherein a thickness of the tungsten silicide layer  
3    is 1550 to 1650Å.

1           5.    The method for forming a double density wordline  
2    of claim 1, wherein a thickness of the poly layer is 1150 to  
3    1250Å.

1           6.    The method for forming a double density wordline  
2    of claim 1, wherein the first insulating layer is a silicon  
3    oxide layer.

1           7.    The method for forming a double density wordline  
2    of claim 6, wherein a thickness of the silicon oxide layer  
3    is 750 to 850Å.

1           8.    The method for forming a double density wordline  
2    of claim 1, wherein the first sacrificial layer is a poly layer.

1           9.    The method for forming a double density wordline  
2    of claim 8, wherein a thickness of the poly layer is 950 to  
3    1050Å.

1           10.   The method for forming a double density wordline  
2    of claim 1, wherein the second insulating layer is a nitride  
3    layer.

1           11. The method for forming a double density wordline  
2 of claim 10, wherein a thickness of the nitride layer is 250  
3 to 350Å.

1           12. The method for forming a double density wordline  
2 of claim 1, wherein the spacer is a nitride layer.

1           13. The method for forming a double density wordline  
2 of claim 1, wherein the second sacrificial layer is a poly  
3 layer.

1           14. A method for forming a double density wordline,  
2 comprising:  
3           providing a semiconductor substrate with a poly layer,  
4           a silicide layer, a oxide layer, a first dummy poly  
5           layer, and a first nitride layer;  
6           forming a photoresist layer with a first opening on the  
7           nitride layer, wherein a portion of the first nitride  
8           layer is exposed by the first opening;  
9           sequentially etching the first nitride layer and the first  
10          dummy poly layer until the oxide layer is exposed  
11          to form a first wordline mask, a second wordline  
12          mask, and a second opening therebetween;  
13          removing the photoresist layer;  
14          conformably forming a second nitride layer cover the first  
15          wordline mask, the second wordline mask, and the  
16          second opening;  
17          anisotropically etching the second nitride layer to form  
18          a spacer on a sidewall of the second opening;  
19          forming a second dummy poly layer cover the first wordline  
20          mask, the second wordline mask, and the second

21 opening, wherein the second opening is filled with  
22 the second dummy poly layer;  
23 etching the second dummy poly layer to a level below the  
24 spacer;  
25 removing the spacer, the first nitride layer, and the  
26 exposing oxide layer to form a third wordline mask  
27 composes of the second dummy poly layer and the oxide  
28 thereunder; and  
29 sequentially etching the silicide layer and the poly layer  
30 to form a first wordline, a second wordline, a third  
31 wordline using the first wordline mask, the second  
32 wordline mask, and the third wordline mask as etching  
33 masks.

1 15. The method for forming a double density wordline  
2 of claim 14, further comprising a step to remove the first  
3 wordline mask, the second wordline mask, and the third wordline  
4 mask.

1 16. The method for forming a double density wordline  
2 of claim 14, wherein a thickness of the poly layer is 1150  
3 to 1250Å.

1 17. The method for forming a double density wordline  
2 of claim 14, wherein the silicide layer is a tungsten silicide  
3 layer.

1 18. The method for forming a double density wordline  
2 of claim 17, wherein a thickness of the tungsten silicide layer  
3 is 1550 to 1650Å.

1           19. The method for forming a double density wordline  
2 of claim 14, wherein a thickness of the oxide layer is 750  
3 to 850Å.

1           20. The method for forming a double density wordline  
2 of claim 14, wherein a thickness of the first dummy poly layer  
3 is 950 to 1050Å.

1           21. The method for forming a double density wordline  
2 of claim 14, wherein a thickness of the first nitride layer  
3 is 250 to 350Å.

1           22. The method for forming a double density wordline  
2 of claim 14, wherein a thickness of the second nitride layer  
3 is 400Å.

1           23. The method for forming a double density wordline  
2 of claim 14, wherein the anisotropic etching is reactive ion  
3 etching or plasma etching.

1           24. The method for forming a double density wordline  
2 of claim 14, wherein a thickness of the second dummy poly layer  
3 is 2000Å.